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10/799,204

03/11/2004

Joan K. Vrtis

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05/01/2006

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EXAMINER

NGUYEN, TAI V

ART UNIT

PAPER NUMBER

3729

DATE MAILED: 05/01/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

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|------------------------------|--------------------------------------|-------------------------------------|--|
| Office Action Summary | Application No. 10/799,204 | Applicant(s) VRTIS ET AL. | |
| | Examiner Tai Van Nguyen | Art Unit 3729 | |
| | | | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 March 2006.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3 and 5-7 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-3 and 5-7 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 10/023,073.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. The applicants' amendment filed 3/15/2006 has been fully considered and made of record.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-2 and 5-7 are rejected under 35 U.S.C. 102(b) as being anticipated by Nagy et al (US 5,139,973) and Max M. Lee (US 2,700,185).

As applied to claim 1, Nagy et al disclose a method comprising: coating a thermally conductive heat spreader body (30, Fig. 6) with an organic surface protectant (plastic molded material in Fig. 6); and coupling the heat spreader body (30) directly to a thermal interface material (32s), the thermal interface material in direct contact with an IC die (14).

Note: The plastic molded material of Nagy is inherently capable of being a “organic surface protectant” because it covers the surface of heat spreader body and the material of plastic, or molded plastic, is organic. The examiner cited Lee et al. (US 2,700,185) as extrinsic evidence to show that plastic materials are inherently Organic.

As applied to claim 2, Nagy et al disclose the coating step comprises immersing the heat spreader body in a dipping solution comprising the organic surface protectant (see column 3, lines 62-66).

As applied to claim 5, Nagy et al disclose thermal interface material is a solder-polymer hybrid (see column 3, lines 50-56).

As applied to claim 6, Nagy et al disclose the first surface of the heat spreader body (30) is coated with an intervening layer (sheet 20 with adhesive) before coating with an organic surface protectant.

As applied to claim 7, Nagy et al disclose the heat spreader body comprises copper (see column 2, lines 63-65).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nagy et al and Lee et al in view of Beck (US 5,110,494).

As applied to claim 3, Nagy et al as relied upon above disclose all Limitations of the claimed invention except the organic surface protectant of triazole compounds. However, Beck teaches the organic surface protectant with triazole compounds (see column 3, lines 24-65).

It would have been obvious to one ordinary skill in the art at this time the invention was made to have modify the Culnane et al method by including the organic surface protectant with triazole compounds, as taught by Beck, to positively provide a material that improves the cleaning surface.

Response to Arguments

6. Applicant's arguments filed 3/15/2006 have been fully considered but they are not persuasive.

The applicants contend that Nagy et al does not teach "coating a thermally conductive heat spreader body" (claim 1, line 2), and Lee does not teach that "a molding compound is an organic surface protectant" (claim1, line 2).

The examiner traverses for at least the following reason:

In Nagy et al. Figure 6, shows the finished semiconductor package with encapsulated stack the die 14 and heat spreader 30, which is coating to protect the die and heat spreader. Furthermore, on top surface of heat spreader including other curable organic resin 32s, which will be filled with electrically conductive particles such as silver (see column 3, lines 50-56).

Note: In Merriam Webster Online Dictionary the word coat is "to cover or spread with finishing, protecting or enclosure". So encapsulating is a form of coating as Nagy had disclosed.

Le shows as extrinsic evidence that a thermal plastic material is an organic polymer (see column 1, lines 15-65+), or since it covers the spreader body (as shown

by Nagy), the plastic molded material of Nagy is equivalent to a "organic surface protectant".

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

Thus, the examiner position that Nagy and Lee fully satisfied and read on of the limitations of claim 1.

Conclusion

7. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tai Van Nguyen whose telephone number is 571-272-4567. The examiner can normally be reached on M-F (7:30 A.M - 4:30 P.M).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter Vo can be reached on 571-272-4690. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TN.
April 26, 2006



A. DEXTER TUGBANG
PRIMARY EXAMINER